

**Working Group 3**  
**Spectrum: Focus on 700 MHz band**  
**Output Paper<sup>1</sup>**  
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## 1. Introduction

### Why this topic?

The ad-hoc Working Group that met at the 38<sup>th</sup> EPRA Meeting in Vilnius considered the future of digital terrestrial broadcasting in the context of forthcoming global changes to the allocation of the 700 MHz frequency band.

Discussions that will almost certainly lead to a mobile allocation being placed into the 700 MHz band (698 – 790 MHz) began at the last World Radiocommunication Conference (WRC) held in early 2012 (WRC-12). Following proposals from predominately African countries into WRC-12), national administrations representing Region 1 (Africa, Europe and parts of the Middle East) agreed to update the Radio Regulations at the next WRC in 2015 subject to final approval. This change could potentially see mobile telecommunication services introduced in the 700 MHz band sometime after 2015. This harmonisation at an ITU level does not prejudice the decisions to be taken at a national or those at European level, regarding the nature of the implementation (of mobile services) and the associated time-scales. This allocation change would bring Region 1 into line with the rest of the world where mobile use, in this band, is already internationally identified.

These developments will have a significant impact on broadcasting. The 700 MHz band, alongside the 500 MHz<sup>3</sup> band and some bands in the VHF range, is currently used predominantly for the delivery of Digital Terrestrial Television (DTT) services across Europe.

In 2013, we therefore took the opportunity within EPRA to share information on:

- how this is likely to affect audiovisual regulators and our stakeholders;
- some of the approaches being taken by members; and
- recent activities undertaken by Europe's institutions.

To help the working group understand these issues, we invited three panellists: **Eric Fournier**, director of spectrum at ANFR, chair of the RSPG, the European Commission's high-level advisory group, and the chair of the CEPT; **Darko Ratkaj** of the EBU; and **Chris Woolford**, director of International Spectrum Policy at Ofcom.

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<sup>1</sup> **Disclaimer:** This document has been produced by the EPRA, an informal network of 52 regulatory authorities in the field of broadcasting. It is not a fully comprehensive overview of the issues, nor does it purport to represent the views or the official position of the EPRA or of any member within the EPRA network.

<sup>2</sup> The author would like to thank Damir Hajduk, EPRA Vice Chairperson for his help in drafting the questionnaire and this paper. Special thanks also to Deirdre Kevin of the European Audiovisual Observatory for the updated data from the MAVISE database.

<sup>3</sup> "500 MHz" a general reference to the band 470 – 694 MHz

This paper provides an overview of the topic, a summary of the market for Digital Terrestrial Television (DTT) amongst EPRA member countries and international developments on UHF spectrum, and of the information provided at the working group by presentations from these panellists.

Finally, it brings together some themes to emerge from the group's discussion, which reflect the variety of views held by members on this very live topic that is currently under intense scrutiny in Europe and beyond.

Spectrum policies have rarely been analysed at EPRA meetings even though they are an important factor that will influence the future of television in many EPRA countries where terrestrial broadcasting is dominant. In 2011, at the 33rd EPRA meeting in Ohrid, spectrum issues were covered in a working group intended to raise awareness and incite discussion amongst broadcast regulators about the EU spectrum debate at the time, and the implications for broadcasting regulation<sup>4</sup>.

One obvious observation is that EPRA should keep this topic at the top of its agenda and ensure it continues to be well informed and active in this sphere.

## **2. Background**

### **The 700 Band**

In Europe, the 700 MHz band is currently used for broadcasting DTT<sup>5</sup> services in addition to other services including Programme making and Special Events (PMSE) and SAP/SAB<sup>6</sup>. It currently represents 30% of all frequencies used by the DTT platforms. Terrestrial television is the preferred way of receiving television in around 50% households in Europe with the highest penetration rates in UK, France, Italy and Spain.

All respondents<sup>7</sup> to a preparatory questionnaire for this working group currently use UHF spectrum to deliver DTT (where digital switchover has begun or is complete). With the exception of Spain, which is about to migrate DTT from 800 MHz, all respondents currently have some of the 700 MHz band allocated to DTT. Finland and Sweden also use some VHF spectrum in the bands 174-230 MHz to deliver DTT; these same bands are reserved for digital radio in Austria and Belgium.

### **What is the role of DTT in European television broadcasting?**

According to the European Audiovisual Observatory, in September 2013, DTT pay-TV platforms had been established in 25 European countries<sup>8</sup>. Croatia, Austria and the Slovak Republic added services in 2013, while the Czech operator is running a trial service. In Serbia, the network operator expanded the initial network for experimental digital broadcasting in November 2013, allowing the trial digital signal to be broadcast from 35 locations, instead of 15, with the coverage of approximately 75% of population. Tests are also currently being run in the Chisinau region in Moldova (MD).

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<sup>4</sup> [http://epra3-production.s3.amazonaws.com/attachments/files/133/original/Intro\\_WG3\\_final.pdf?1323685222](http://epra3-production.s3.amazonaws.com/attachments/files/133/original/Intro_WG3_final.pdf?1323685222)

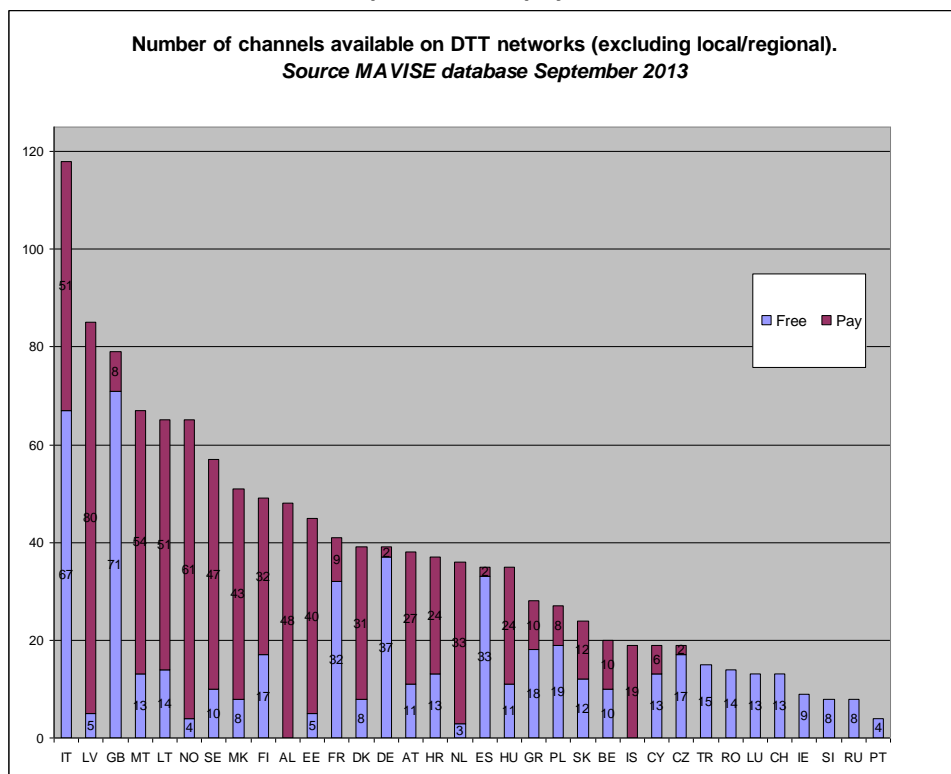
<sup>5</sup> Digital Terrestrial Television

<sup>6</sup> SAB - Services Ancillary to Broadcasting, SAP - Services Ancillary to Programming

<sup>7</sup> Armenia, Austria, The Belgian CSA and VRM, Bulgaria, Croatia, Cyprus, Finland, France, Germany, Gibraltar, Greece, Ireland, Italy, Lithuania, Macedonia, Netherlands, Norway, Poland, Romania, Serbia, Spain, Sweden, Switzerland and the United Kingdom.

<sup>8</sup> Austria, Croatia, Poland and the Slovak Republic added services in 2013, and the Czech operator is also running a trial Pay-DTT service.

**Fig 1: Channels on DTT networks in Europe: free and pay<sup>9</sup>**



According to the **MAVISE** database, in September 2013, the number of channels available on DTT networks in the EU member states (28 with Croatia) included the following: 456 free national or international channels; 561 pay channels, and more than 1,000 local and regional channels. For the 39 countries of the European Audiovisual Observatory the equivalent numbers are: 514 free national or international, 732 pay, and more than 1,000 local and regional channels. The Italian networks have by far the most national channels, with the lowest offer available in Portugal. The table, above, also indicates the importance of pay DTT for providing a variety of content in many countries. This is not however the case in the UK, France, Germany, Italy or Spain where a large amount of free content is available.

According to the responses to the preparatory survey, the take-up of DTT varies between Member States. In several countries, a significant number of households use DTT as their main means of TV reception, such as Italy (99%) Greece (50-60%), France (59.6%) Finland (39%), Lithuania (49%), Spain (77%) and the UK (40%). In others, the penetration of DTT is very low, particularly in central European countries such as Austria (6%), Germany (7.8%) and Belgium, where only 2.9% of households in Brussels and Wallonia use DTT. Equally, there is a very wide range in the percentage of available channels in any given country that the DTT platform carries – from all channels in Gibraltar, to just a handful in countries such as Belgium and Switzerland, where satellite and IPTV are much more prevalent.

Indeed, the penetration levels of other platforms such as cable, satellite and IPTV is also variable. Cable is an important platform in much of central Europe, with a high number of households in Belgium (65-70%) the Netherlands (66.1%) and Switzerland (79%) using it as their primary means of

<sup>9</sup> [http://www.obs.coe.int/about/oea/pr/mavise\\_2013mars\\_dtt\\_so.html](http://www.obs.coe.int/about/oea/pr/mavise_2013mars_dtt_so.html) . This table has been updated by MAVISE to include data for Austria and Croatia pay services launched in 2013.

TV reception. Cable is also the most popular transmission platform in Finland (55%), Germany (44.5%), Gibraltar (75%), Lithuania (51%), Norway (43.2%) and Serbia (42%) but low in France (9%). Satellite penetration is relatively high in a number of countries – including Austria (49%), Germany (44.4%) Ireland (47%), Poland (37.9%), the UK (37%), and Italy (35%) – but low in others, such as Bulgaria (7.3%), Finland (6%), the Netherlands (8.4%), Serbia (9%), Switzerland (14%). There is no satellite TV platform in Armenia. Satellite and cable platforms tend to offer a wider variety and choice of channels, however, and often carry the majority of channels available in any given country (although this includes subscription-only channels).

IPTV is beginning to make inroads in several countries that responded to the survey, with penetration at 37.1% in France, 25% in Belgium, Croatia and Switzerland. As is the case with cable and satellite, there is a huge variation in availability and take-up. 'Hybrid' DTT/IPTV platforms are already beginning to emerge in a number of countries. In the Netherlands, the telecoms operator KPN is already offering a package which includes a combination of IPTV for the main TV set, and DTT for the second. In the UK, hybrid services already exist on all TV platforms. In Poland, the national PSB Telewizja Polska and two commercial broadcasters are offering hybrid services. In Sweden, a pay DTT operator is offering a video on demand service over their network. In Finland, test transmissions of an advanced electronic programme guide delivered via internet are currently on air.

DTT is undergoing changes. For the first time, the number of subscriptions to pay-DTT dropped in 2012 by an overall figure of 13% (according to Screen Digest data) with the most significant drop in Italy (almost 1 million subscribers). At the same time some planned pay-DTT services in Spain and Portugal have not materialised, services have ceased elsewhere (Italy and France) and in several smaller countries the development of a financially successful model for pay DTT is proving difficult. On the other hand, pay-DTT services have long been established in certain smaller states such as Estonia, Malta, Lithuania, the “Former Yugoslav Republic of Macedonia”, and Albania where these pay services were launched in advance of free DTT.

A number of survey respondents have also begun the process of network upgrades. A gradual transition to the DVB-T2 transmission standard has begun in Austria and Sweden and plans are being developed for the transition from DVB-T/MPEG2 to DVB-T2/MPEG4 in Finland. In Poland, the DVB-T2 standard is currently being tested. In the UK, two interim multiplexes are due to launch shortly using DVB-T2 and MPEG4.

It is also notable that developments in the popularity and strength of the DTT platform vary significantly from country to country. For example, in Germany a large broadcaster (the RTL Group) has just announced it will be exiting the platform, while in Poland viewers are “abandoning” paid platforms in favour of free to view DTT.

### **Public Policy Interventions supporting the DTT platform**

According to survey responses, public policy interventions to support the DTT platform vary, and in several Member countries such as Cyprus and Germany there are none. In Switzerland, a provision in the country's radio and television law which made DTT part of a state subsidy mechanism to promote new wireless technologies was abolished in November 2012, in recognition of the low take-up of DTT in comparison with other platforms such as cable.

Secured spectrum for public service broadcasters is a relatively popular measure and is implemented in Belgium, Croatia, Gibraltar, Ireland, Norway, Spain and the UK. A range of measures are taken in relation to the funding arrangements of the platform in several countries. In Armenia and Belgium the network is publicly funded, and in Austria there is a non-commercial broadcasting fund and a private broadcasting fund which is administered by the regulator for broadcasting and telecommunications (RTR). In the UK and France, no fees are currently payable for the spectrum used

by multiplex operators, but Ofcom has announced its intention to begin charging fees for broadcasting in the future. Currently, the UK-wide DTT multiplexes pay £10k per year for their Broadcasting Act licence. The local TV multiplex operator pays £5k. In addition, Ofcom is currently consulting<sup>10</sup> on introducing additional charges to the DTT multiplex operators that would reflect ofcom's costs in managing the spectrum they use (e.g. issuing and varying licences, interference investigations etc.).

In Norway, the economic operation of the DTT network is secured by allocating capacity to paid channels, as well as the free-to-air public service channels. In the Netherlands, there is an instrument of benefit sharing whereby a certain percentage of the multiplex owner's turnover needs to be paid to government. In Spain, there is a public fund for extending coverage to rural areas.

A number of responses also discussed help schemes which were developed during the process of digital switchover. In Lithuania, there is a public fund to compensate the costs of buying DTT receivers for low income households and a similar scheme Italy, subsidies were made available for those buying or renting DTT set top boxes (gradually phased out by 2006). In Serbia, the Ministry of Foreign and Internal Trade and Telecommunications is currently developing a help scheme for socially vulnerable citizens and the most disadvantaged members of the population.

### **Why is the 700 band so attractive?**

Spectrum scarcity is particularly relevant for frequencies in UHF bands IV and V (470 to 862 MHz). Spectrum in the range 300 MHz – 3 GHz is commonly referred to as the “sweet-spot”. Generally speaking this is because it is in a range that offers: 1) attractive propagation characteristics 2) sufficient usable bandwidth and can support practical antenna sizes. As a result it increasingly attracts demand from a wide range of services.

Its attraction for mobile use is threefold:

- It would help meet growth in mobile data requirements by increasing the overall capacity of mobile networks;
- It would provide a better quality of service in difficult to reach locations, in rural areas and inside buildings; and
- Due to its likely global use for mobile broadband services after 2015: enabling economies of scale in mobile handsets and supporting infrastructure equipment.

Arguments for retaining the band for DTT services are that this band also has benefits for television broadcasting (including similar provision of economies of scale for equipment) and provides near-universal low-cost access to public service broadcast services and maintains viewers' choice of platform, services and equipment.

Nevertheless, UHF TV can continue to exist in other bands if countries decide to re-allocate this band to mobile broadband, particularly if and when more efficient transmission and compression technologies are rolled out (DVB-T2 and MPEG-4).

### **3. Recent international developments and lessons from the Working Group**

There are two key areas of work developing in parallel in this area:

**Globally:** The World Radiocommunication Conference (WRC-12) at the ITU (International Telecommunication Union) concluded on the 17th of February 2012 and decided that the subsequent WRC in 2015 (WRC-15) would insert a mobile allocation into the 700 MHz band, alongside the broadcasting allocations. This would be for Region 1 countries (Africa, Europe and parts

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<sup>10</sup> Spectrum Pricing: A framework for setting cost based fees  
<http://stakeholders.ofcom.org.uk/binaries/consultations/cbfframework/summary/condoc.pdf>

of the Middle East) and would, as a result, set a course for European countries to consider a second digital dividend.

**In Europe:** In March 2012, the European Parliament adopted its Radio Spectrum Policy Programme (RSPP)<sup>11</sup> which, in Article 3, states that at least 1200 MHz of spectrum suitable for wireless data traffic should be identified by 2015 in the frequency range between 400 MHz and 6 GHz (Article 9). In April 2012 the European Commission sought advice from the Radio Spectrum Policy Group (RSPG), on the strategic issues and challenges to be addressed in Europe in order to meet the objective to satisfy the demand for wireless broadband services in the context of the latest regulatory environment.

In September 2012, the Radio Spectrum Policy Group (via the Working Group looking at the demand for wireless broadband) issued a questionnaire on the long term spectrum requirements for television broadcasting in the European Union. This questionnaire made specific reference to the 700 MHz band. Indeed, EPRA members were urged at the time to contribute to that consultation<sup>12</sup>. The EBU published their response<sup>13</sup> to the Draft of the RSPG Opinion on Wireless Broadband, in April 2013.

The RSPG's Opinion on Strategic Challenges facing Europe in addressing the growing spectrum demand for wireless broadband was published<sup>14</sup> on 13th June 2013.

In March this year, the European Commission issued a mandate to the European Conference of Postal and Telecommunications Administrations (CEPT)<sup>15</sup> to develop a set of common minimal and least restrictive technical conditions for use of the 700 MHz band by mobile broadband applications (BEM)<sup>16</sup>. The mandate foresees two deliverables: the first is a report by the end of 2014 with a preliminary set of technical conditions; and the second, in 2016, is a report with the final technical conditions accounting for any changes needed as a consequence of the WRC-15 outcome. In addition, the CEPT recently created a group to address its "Long term vision for the UHF broadcasting band". The group, known as TG6<sup>17</sup>, held its first meeting in October.

At the working group, we heard an update from **Eric Fournier**, who is the chair both of CEPT and the RSPG. Eric gave us a global picture of the likely future of the 700 MHz band, which he confirmed was most likely be co-allocated to mobile broadband at WRC 15. He explained what this will mean in practice – that is, he made clear, that there has to be a harmonised approach to this band in Europe and a uniform decision on how it is used. To help inform such a decision, he described the work being done in the meantime by the RSPG and the CEPT in particular under the mandate from the Commission to look into the technical aspects of harmonisation of the 700 MHz for broadband. He gave us some detail about those technical challenges, explaining all of the other uses of the band (security networks, PMSE)<sup>18</sup>.

<sup>11</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:081:0007:0017:EN:PDF>

<sup>12</sup> [http://www.epra.org/news\\_items/participation-in-rspg-consultation](http://www.epra.org/news_items/participation-in-rspg-consultation)

<sup>13</sup> <http://www3.ebu.ch/cms/en/sites/ebu/contents/news/2013/05/ebu-stresses-importance-of-700-m.html>

<sup>14</sup> [http://rspg.groups.eu.int/rspg\\_opinions/index\\_en.htm](http://rspg.groups.eu.int/rspg_opinions/index_en.htm)

<sup>15</sup> European Commission, Radio Spectrum Committee, working document RSCOM 12-37rev3, 20 Feb 2013, "Mandate to CEPT to develop harmonised technical conditions for the 694-790 MHz (700MHz) frequency band in the EU for the provision of wireless broadband electronic communications services and other uses in support of EU spectrum policy priorities" at [https://circabc.europa.eu/d/d/workspace/SpacesStore/6eda88bf-ed1a-4af4-bb26-9f985db5956d/20130312-125805\\_RSCOM12-37rev3\\_Mandate\\_CEPT\\_700\\_MHz%20FINAL%20doc.pdf](https://circabc.europa.eu/d/d/workspace/SpacesStore/6eda88bf-ed1a-4af4-bb26-9f985db5956d/20130312-125805_RSCOM12-37rev3_Mandate_CEPT_700_MHz%20FINAL%20doc.pdf)

<sup>16</sup> BEM = Block Edge Mask, a method used to define broad technical conditions for use in a spectrum band.

<sup>17</sup> <http://www.cept.org/ecc/groups/ecc/tg6/page/terms-of-reference>

<sup>18</sup> For the full technical detail, please see Eric's full presentation: <http://www.epra.org/attachments/vilnius-wg3-spectrum-focus-on-700mhz-presentation-by-eric-fournier-rspg>

The work that he described was predicated on the acknowledgment of the need for spectrum to meet growing mobile broadband demand, with some forecast studies indicating that growth in traffic will continue at an annual rate between 50% and 70% in next years.

He also explained that the first CEPT report was due in November 2014, highlighting the lengthy processes involved.

**Darko Ratkaj**, who is Senior Project Manager, Technology & Innovation at the EBU, set out the benefits of the current terrestrial broadcasting offer, including its wide availability, the fact that it is often available free to air, its flexibility as a platform, its efficiency in terms of the use of allotted spectrum, the high quality of the service and reception that it provides to viewers, its undoubted market success and the possibilities for technological development.

He also made a strong argument that there is increased demand for this platform – albeit not in ALL countries – and the negative impact on both viewers and broadcasters of the potential loss of this platform and therefore this band. As the main carrier of public service content, any decisions relating to DTT and the spectrum that it uses needed to be made primarily in the public interest.<sup>19</sup>

Darko questioned the assumption that mobile data traffic would grow as significantly or quickly as suggested, and pointed to alternative, more conservative studies.

#### 4. What are Members doing?

In most countries, regulatory authorities are responsible for spectrum management but carry out these responsibilities in line with national government policy: the challenges arising from the potential reallocation of the 700 MHz band will therefore need to be addressed by multiple organisations.

Although most discussions and articles on this topic imply that the destiny of 700 MHz has already been decided<sup>20</sup> there are still many factors that have to be analysed in each of the countries in order to achieve harmonized allocation of this spectrum. In Austria, for example, due to the geographic situation in the border regions, there are no frequencies under 700 MHz available.

The majority of responses to the preparatory questionnaire indicate that, while discussions and studies are taking place in a number of countries including Germany, Norway, Poland and Switzerland, a final decision regarding the 700 MHz band is yet to be made in most EPRA member countries.

Ofcom (UK) published its strategy for UHF spectrum in November 2012<sup>21</sup> and launched a public consultation<sup>22</sup> in April 2013 which focused on the future use of the 700 MHz band. At the working group, we heard from **Chris Woolford** of Ofcom. He described the UK UHF spectrum strategy, which Ofcom had been working on for the last year and that had the dual purpose of seeking to enable a harmonised release of the 700 MHz band for mobile broadband and also ensuring that the DTT platform can access the 600 MHz band (in the UK) alongside other services sharing spectrum with DTT, including Local TV, PMSE, and white space devices.

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<sup>19</sup> Darko's full presentation is also on the EPRA website: <http://www.epra.org/attachments/vilnius-wg3-spectrum-focus-on-700mhz-presentation-by-darko-ratkaj-ebu>

<sup>20</sup> <http://www.lesechos.fr/entreprises-secteurs/medias/actu/0202768886079-tnt-menace-sur-l-avenir-de-la-haute-definition-567167.php>

<sup>21</sup> [http://stakeholders.ofcom.org.uk/binaries/consultations/uhf-strategy/statement/UHF\\_statement.pdf](http://stakeholders.ofcom.org.uk/binaries/consultations/uhf-strategy/statement/UHF_statement.pdf)

<sup>22</sup> <http://stakeholders.ofcom.org.uk/consultations/700mhz-cfi/>

Sweden has seen some lively debate domestically. The Government has to make a decision on the future of the DTT network before 2014, and has investigated two alternatives (to either keep or clear 700 MHz band), taking into account factors such as consumer interest, public interest and the international context.

In France, the Director General for Media and Cultural Industries at the Ministry for Culture and Communications launched a public consultation<sup>23</sup> in July 2013 about the future of DTT and its relation to spectrum. At the working group, it was noted that France was at a similar stage in its thinking to Sweden and UK, and that there was an ongoing political debate. For the French, it was difficult to reduce the debate to a purely monetary question (i.e. the funds achieved through the auctioning of this spectrum to telecoms operators) as broadcasters made a significant input into the French cultural landscape as well as its economy. France is also factoring the cost of changing receivers for DVB-T2 into its considerations.

The Finnish government has also made plans to allocate the band for mobile broadband in 2017.

Poland felt strongly that the 700 MHz band should be reserved for DTT, which had a very successful launch. 30% of the population receive television via the terrestrial platform only. Additionally, broadcasters in Poland expect to have access to this spectrum (i.e. depend on that certainty). A public consultation conducted by the Polish telecoms regulator in June to discuss the issue found that respondents were split down the middle between clearing and retaining the band for DTT.

Conversely, Italy, which has near 100% DTT coverage and usage, is already beginning to consider how to clear the 700 MHz band the future of its DTT platform.

Greece provided a fresh angle on the question, pointing out that because it had only just migrated to DTT, it was already using new equipment (capable of carrying DVB-T2). In Greece, Free to Air television is very popular, among an ageing population who are unlikely to support change. On the other hand, mobile represents a huge part of the voice market in Greece, and there is just 40% broadband penetration.

In Ireland, where most viewing takes place over cable and satellite, there is a very low take-up of the DTT platform. A different challenge there is the provision of a basic package for those who want only that. Additionally, most paid for offers constitute UK content, so the debate around DTT becomes one of plurality.

It was clear that the markets in many EPRA member countries are very different, with different levels of penetration and reliance on the DTT platform – particularly for Free to View public service content. Despite this, there did seem to be a common acknowledgement – with perhaps some exceptions – that change was inevitable.

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<sup>23</sup> <http://www.culturecommunication.gouv.fr/Disciplines-et-secteurs/Audiovisuel/Actualites/Consultation-sur-l-avenir-de-la-plate-forme-TNT>



## 5. Emerging Themes

1. Future demand for spectrum for mobile broadband will grow. There is clear agreement on this, even if there is some disagreement on the data and projections about the speed at which this will happen.
2. Few telcos are currently expressing a strong desire to access the 700 MHz band at this moment. But it is extremely likely that they will want it by 2020, planning for which needs to start now.
3. It is essential to understand implications of clearing for consumers. It is clear that most EPRA countries are aware that spectrum clearance of this kind must by definition take time, and requires careful planning, a structured approach in an appropriate timeframe (given the lead times involved in making changes to spectrum use).

As part of these considerations, the overarching theme to emerge was perhaps that this debate should not be reduced to a conflict between the needs of broadcasting vs. mobile: rather, it should focus on finding the right way to get the right content to viewers and meet the needs of citizens.

It is also clear that future strategy for the UHF DTT spectrum as a whole is an increasingly hot topic and a very delicate political issue. It is one that broadcasting regulators such as EPRA members must ensure they engage with closely to ensure their voices feed into the debate.